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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,766	10/19/2001	Yasumasa Takao	215217US0	6675

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EXAMINER	
UHLIR, NIKOLAS J	

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 05/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/981,766	TAKAO ET AL.	
	Examiner	Art Unit	
	Nikolas J. Uhlir	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *6, 8-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-5, 7, 10-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment/arguments dated 02/23/2004. Applicant's amendment to the instant claims is sufficient to overcome the previous grounds of rejection. Accordingly, the previous grounds of rejection are withdrawn. However, the application is not in condition for allowance in view of the new grounds of rejection set forth below.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3-4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. In the instant case, claims 3-4 require the Aluminum Nitride powder to be formed from a raw material powder *consisting* of Al (claim 3) or a combination of a filler powder consisting of Al and O and a powder consisting of C (claim 4), and a nitridation reaction is proceeded by using a flame in the presence of nitrogen, ammonia, *or an inert gas*. The examiner does not understand how an Aluminum Nitride powder can be formed from a raw material powder that does not contain nitrogen in an inert gas. Inert gases (i.e. Ar, He, Ne, Kr, Rn, Xe) do not react, hence their designation as inert. How can a nitride be formed in solely an inert gas?

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5, 7, and 10-20 rejected under 35 U.S.C. 102(b) as being anticipated by Parent (US5190738).

7. The examiner notes that Parent was cited in several prior office actions and utilized as a 102(b) type reference. While this 102(b) rejection was never officially withdrawn, careful reexamination of the reference and the applicant's arguments have reestablished its validity. The applicant's representative is directed to the examiner note below for a discussion of the previous application of Parent and why the reference is once again being applied.

8. The limitations "the powder is manufactured... element C," in claim 1, and the entirety of claims 2-5, 10, 13, 16 are process limitations in a product claim and do not appear to be further limiting in so far as the structure of the product is concerned. Even though product claims are limited and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP § 2113.

9. Bearing the above interpretation in mind, claim 1 requires an aluminum nitride filler powder comprising Al, O, and N, or Al and N, wherein the filler powder has a particle size ranging from 0.001-500μ, with an average particle diameter of 10-100μ, wherein the external shape of the particles is spherical with a ratio of long axis diameter to short axis diameter is about 1:1.

10. Regarding these limitations, Parent teaches a process for producing unagglomerated single crystals of Aluminum Nitride via carbothermal reaction. The product AlN powder has a particle diameter between 10-100μ, more preferably 10-60μ (column 2, lines 48-50). Thus, the particle diameter limitation of claim 1 is met. Regarding the short axis diameter to long axis diameter ratio. Parent teaches that the single crystals of AlN are "approximately spherical" (column 2, lines 59-61). As a "truly" spherical particle will have a short axis diameter to long axis diameter of 1:1, the examiner takes the position that "approximately spherical" in Parent means "approximately" or "about" spherical. Thus, the approximately spherical powder of Parent will have a short axis diameter to long axis diameter of "about" 1:1. Regarding the composition of the AlN powder required by claim 1. Parent teaches that the following reaction is utilized to generate the AlN powder:

$$Na_2O.xAl_2O_3 + (3x+1)C+xN_2 \rightarrow 2Na+(3x+1)CO + \mathbf{2xAlN}$$

(column 3, lines 35-40). As is clearly shown, the final product of the Parent reaction is AlN, sodium, and carbon monoxide. Thus, the final product of Parent, AlN, reads on the instant claims, though it was made by another or materially different process. Accordingly, Parent anticipates the limitations of claim 1.

11. Claims 2-5 further limit the process by which the AlN powder of claim 1 is formed. However, no evidence has been presented to show that the product produced by the process claimed is any different than that of the prior art. Thus, Parent anticipates the limitations of claim 2 for the reasons set forth above.

12. The limitations of claim 7 are anticipated as set forth above for claim 1. It is noted that Parent teaches the use of the AlN as a filler material in a polymer binder (column 2, lines 10-18).

13. Claim 10 is met as set forth above at section 11.

14. Claim 11 is met as set forth above for claims 7 and 10.

15. Claim 12 is met as set forth above for claims 2 and 7.

16. Claim 13 is met as set forth above at section 11.

17. Claim 14 is met as set forth above for claims 7 and 13.

18. Claim 15 is met as set forth above for claims 3 and 7.

19. Claim 16 is met as set forth above at section 11.

20. Claim 17 is met as set forth above for claims 7 and 16.

21. Claim 18 is met as set forth above for claims 4 and 7.

22. Claim 19 is met as set forth above for claim 5 and 7.

23. Claim 20 is met as set forth above for claim 1.

24. Claims 1-5, 7, and 10-20 rejected under 35 U.S.C. 102(b) as being anticipated by Ochiai et al. (US5283542).

25. The limitations "the powder is manufactured... element C," in claim 1, and the entirety of claims 2-5, 10, 13, 16 are process limitations in a product claim and do not

appear to be further limiting in so far as the structure of the product is concerned. Even though product claims are limited and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP § 2113.

26. Regarding claim 1, Ochiai teaches a composite material that comprises a polymer matrix and a spherical AlN filler powder having an average particle diameter from 20-90μ (column 3, lines 50-69). Given that the AlN particles are described as spherical, it is the examiners position that the long axis/short axis diameter ratio of the particles of Ochiai is 1:1. Thus, all of the product limitations of claim 1 are met.

27. Claims 2-5, 7, and 10-20 are met as set forth above for claim 1 (section 26).

Examiner's Note

28. As noted above, the Parent reference was previously cited as a 102(b) type reference. While the rejection over the reference was never officially withdrawn, prosecution of the application proceeded with the focus being on prior art that formed spherical AlN particles via a method that was more similar to the applicant's claimed method. However, careful consideration of the Parent reference and the applicant's prior arguments has revealed that the Parent reference is valid prior art under 35 U.S.C 102(b).

29. The applicant's previous arguments with respect to Parent were that the method of Parent resulted in an AlN filler powder that contained group Ia elements as impurities. While this argument is potentially valid, the applicant has presented no evidence that establishes that the process of Parent will result in AlN powders that necessarily contain these impurities. Further, the Parent reference seems to suggest that the AlN filler powder is free of these impurities, as Parent forms the AlN powder by the following reaction:

$$Na_2O.xAl_2O_3 + (3x+1)C+xN_2 \rightarrow 2Na+(3x+1)CO + \mathbf{2xAlN}$$

(column 3, lines 35-40). Thus, as shown by the above reaction, the reaction produces sodium, carbon dioxide, and Aluminum Nitride. As illustrated by the reaction, the product AlN does not contain Na. Rather, the process produces Na *as a byproduct*. Thus, the reference still reads on the instant claims, though it forms spherical AlN by another and materially different process.

30. The examiner cordially invites the applicant's representative to contact him if he would like to discuss the reapplication of the Parent reference or any of the other substantive grounds of rejection.

Response to Arguments

31. Applicant's arguments with respect to claims 1-5, 7, and 10-20 have been considered but are moot in view of the new ground(s) of rejection. Specifically, the applicant's arguments are all drawn to grounds of rejection that are no longer maintained by the examiner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 571-272-1517. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul J. Thibodeau can be reached on 571-272-1516. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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